

WHAT IS CLAIMED IS:

1 1. An electronic device comprising:
2 a plurality of external terminals each having a
3 base member and a metal thin film formed in direct contact
4 with a surface of the base member,
5 the metal thin film being made of an alloy of tin
6 and bismuth and the bismuth being contained in the alloy so
7 as to satisfy any one of the following conditional
8 expressions;
9 (a) $20 \leq X_m \leq 25$ and $0.5 \leq C_{am} \leq 4.5$,
10 (b) $15 \leq X_m \leq 20$ and $0.7 \leq C_{am} \leq 4.5$,
11 (c) $10 < X_m \leq 15$ and $4.5 \leq C_{am} \leq 6.0$,
12 wherein X_m indicating the thickness (MIC) of the metal thin
13 film and C_{am} indicating wt % of the bismuth in the metal
14 thin film.

1 2. An electronic device comprising:
2 a plurality of external terminals each having a
3 base member and a metal thin film formed in direct contact
4 with a surface of the base member,
5 the metal thin film being made of an alloy of tin
6 and bismuth and the bismuth being contained in the alloy so
7 as to satisfy any one of the following conditional
8 expressions;
9 (a) $10 < X_m \leq 25$, $0.5 \leq C_{am} \leq 6.0$ and $-8C_{am} + 46 < X_m \leq -$
10 $8C_{am} + 54$,
11 (b) $10 < X_m \leq 25$, $0.5 \leq C_{am} \leq 6.0$ and $-5C_{am} + 25 \leq X_m \leq -$

12 8Cam + 46,
13 (c) $10 < X_m \leq 25$, $0.5 \leq C_{am} \leq 6.0$ and $-5C_{am} + 15 \leq X_m < -$
14 $5C_{am} + 25$,
15 wherein X_m indicating the thickness (MIC) of the metal thin
16 film and C_{am} indicating wt % of the bismuth in the metal
17 thin film.

1 3. An electronic device comprising:
2 a plurality of external terminals each having a
3 base member and a metal thin film formed in direct contact
4 with a surface of the base member,
5 the metal thin film being made of an alloy of tin
6 and silver and the silver being contained in the alloy so
7 as to satisfy the following conditional expression;
8 $15 \leq X_m \leq 25$ and $2.0 \leq C_{am} \leq 4.0$,
9 wherein X_m indicating the thickness (MIC) of the metal thin
10 film and C_{am} indicating wt % of the silver in the metal
11 thin film.

1 4. An electronic device comprising:
2 a plurality of external terminals each having a
3 base member and a metal thin film formed in direct contact
4 with a surface of the base member,
5 the metal thin film being made of an alloy of tin
6 and zinc and the zinc being contained in the alloy so as to
7 satisfy the following conditional expression;
8 $15 \leq X_m \leq 30$ and $4.0 \leq C_{am} \leq 9.0$,

9 wherein X_m indicating the thickness (MIC) of the metal thin
10 film and C_{am} indicating wt % of the silver in the metal
11 thin film.

1 5. The electronic device as claimed in claim 1,
2 wherein the metal thin film is formed by plating.

1 6. The electronic device as claimed in claim 1,
2 wherein the base member is composed of a conductive
3 material.

1 7. The electronic device as claimed in claim 6,
2 wherein the conductive material comprises a metal selected
3 among the group including an iron-nickel alloy, an iron-
4 nickel-based alloy, copper, a copper-based alloy and iron.

1 8. The electronic device as claimed in claim 2,
2 wherein the metal thin film is formed by plating.

1 9. The electronic device as claimed in claim 2,
2 wherein the base member is composed of a conductive
3 material.

1 10. The electronic device as claimed in claim 9,
2 wherein the conductive material comprises a metal selected
3 among the group including an iron-nickel alloy, an iron-
4 nickel-based alloy, copper, a copper-based alloy and iron.